



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/735,414	12/12/2003	Wolfgang Dettmann	2002 P 13806 US	2142
48154	7590	07/12/2006	EXAMINER	
SLATER & MATSIL LLP 17950 PRESTON ROAD SUITE 1000 DALLAS, TX 75252			AKANBI, ISIAKA O	
			ART UNIT	PAPER NUMBER
			2877	

DATE MAILED: 07/12/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/735,414	<b>Applicant(s)</b> DETTMANN ET AL.	
	<b>Examiner</b> Isiaka O. Akanbi	<b>Art Unit</b> 2877	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 20 April 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 2, 4, 7- 18 is/are rejected.
- 7) ☒ Claim(s) 3,5,6 and 19-21 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Amendment*

The amendment file 20 April 2006 has been entered into this application.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim are rejected under 35 U.S.C. 103(a) as being unpatentable over Danko (6,879,391 B1) in view of Feldman et al. (4,595,289)

Claims 1, 7 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over of Danko in view of Feldman. The reference of Danko teaches of the features of claim 1, 7 and 13, comprising calibrating a first image of each array structure for selected locations (fig. 1), calculating Fourier coefficients at a reference point of an array/diffraction grating (63), calculating a residual image (63) from a difference between an original image of the array structure and a Fourier expansion and forming a threshold value for the calculation of an image indicating an error (col. 4, line 35-50)(col. 6, line 22-col. 7, line 1-67), however the reference of Danko is silent regarding calibrating a first image of each array structure for selected locations on (i.e. lithography mask). The use of same method/apparatus for inspecting/detecting (i.e. wafer/mask) is generally known in the art. The reference of Feldman teaches of using the same method/apparatus for inspecting/detecting both masks and wafers (col. 2, line 8-13)(col. 3, line 11-17). It would have been obvious to one having ordinary skill in the art at the time of invention to use the same method/apparatus for calibrating a first image of each array structure for selected locations on (i.e. lithography mask or wafer) for the purpose of saving labor and time.

As to claims 2 and 18, Danko and Feldman discloses everything claimed, as applied to claim 1 and 13 above, in addition Danko discloses wherein the calibrating is carried out by determining a mask rotation and determining a magnification (fig. 1)(col. 6, line 57-col. 7, line 1-55).

As to claim 4, Danko and Feldman discloses everything claimed, as applied to claim 1 above, in addition Danko discloses wherein a frequency filter is used to reduce curling in the residual image (col. 2, line 21-32).

As to claim 14, Danko and Feldman discloses everything claimed, as applied to claim 13 above, in addition Danko discloses repairing the lithography mask based upon results of the inspecting (fig. 1)(25).

Claims 8, 9, 10, 11,12 and 15-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Danko (6,879,391 B1) in view of the admitted prior art of applicant.

As to claims 8-10, Danko and Feldman disclose the claimed invention, as applied to claim 7 above, except for is silent regarding wherein the lithography mask comprising a chromium mask, a half-tone mask or an interference mask, however the applicant discloses (col. 0054, line 1-3) that this is a well known. Therefore it would have been obvious to one having ordinary skill in the art at the time of invention to incorporate the teachings of Danko in conjunction with applicant indication of feature to provide a lithography mask that may be a chromium mask, a half-tone mask or an interference mask to meet the terms of the claims for the purpose of inspection and repairing. (see In Ex parte McGaughey, 6 USPQ2d 1334, 1337 (Bd. Pat. App. & Int.1988).

As to claims 11-12 and 15-17, Danko and Feldman disclose the claimed invention, as applied to claim 7 and 14 above, except for is silent regarding wherein the repairing is carried out by means of ion etching or by use of an atom microscope for microprocessing of the lithography mask, however the applicant discloses (col. 0056, line 1-3) that this is a well known. Therefore it would have been obvious to one having ordinary skill in the art at the time of invention to incorporate the teachings of Danko in conjunction with applicant indication of feature to carried out by means of ion etching or by use of an atom microscope for microprocessing of the lithography mask to meet the terms of the claims for the purpose of inspecting and repairing lithography mask. Further, it would have been obvious to one having ordinary skill in the art at the time of invention to effect the semiconductor substrate comprising

of forming a portion of an array of memory cells for the purpose of inspecting and repairing lithography mask. (see In Ex parte McGaughey, 6 USPQ2d 1334, 1337 (Bd. Pat. App. & Int. 1988).

### ***Allowable Subject Matter***

Claims 3, 5-6, 19, 20 and 21 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

As to claims 3 and 19, the prior art of record, taken alone or in combination, fails to disclose or render obvious wherein a rotation angle and a magnification factor are chosen such that a magnitude of the associated Fourier coefficient is a maximum, in combination with the rest of the limitations of the claim.

As to claims 5 and 20, the prior art of record, taken alone or in combination, fails to disclose or render obvious determining a mean value of an error in a line width by forming an average value over all the measurement points and rejecting the lithography mask if the error in the line width is greater than the predetermined threshold value, in combination with the rest of the limitations of the claim. Additionally, the prior art of record, taken alone or in combination, fails to disclose or render obvious converting the Fourier coefficients to a line width value by means of back-transformation and a predetermined intensity threshold value, in combination with the rest of the limitations of the claim. Claim 6 is allowable by virtue of its dependency on claim 5.

As to claim 21, the prior art of record, taken alone or in combination, fails to disclose or render obvious measuring the width of the image lines and the image lines separations by use of Fourier analysis, in combination with the rest of the limitations of the claim.

### **Additional Prior Art**

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The references listed in the attached form PTO-892 teach of other prior art a method for inspection of periodic structures on a lithography mask using a microscope that may anticipate or obviate the claims of the applicant's invention.

### ***Response to Arguments***

Applicant's arguments/remarks, see pages 7-9, filed 20 April 2006, with respect to the rejection(s) of claim(s) 1, 2, 4, 7, 13-14, 18 and 8-12, 15-17 under 35 U.S.C. 102(e) and 35 U.S.C. 103(a) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of claim amendment.

### ***Conclusion***


### **Fax/Telephone Information**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Isiaka Akanbi whose telephone number is (571) 272-8658. The examiner can normally be reached on 8:00 a.m. - 4:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory J. Toatley Jr. can be reached on (571) 272-2800 ext. 77. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Isiaka Akanbi  
June 28, 2006



**HWA (ANDREW) LEE**  
**PRIMARY EXAMINER**